

1644

RAW SEQUENCE LISTING DATE: 06/05/2000
PATENT APPLICATION: US/09/401,636 TIME: 10:34:53

Input Set : A:\Sequence
Output Set: N:\CRF3\06022000\I401636.raw

4 <110> APPLICANT: Hellman, Lars T.
6 <120> TITLE OF INVENTION: ENHANCED VACCINES
8 <130> FILE REFERENCE: 10223/006001
10 <140> CURRENT APPLICATION NUMBER: US 09/401,636
11 <141> CURRENT FILING DATE: 1999-09-22
13 <150> PRIOR APPLICATION NUMBER: US 60/106,652
14 <151> PRIOR FILING DATE: 1998-11-02
16 <160> NUMBER OF SEQ ID NOS: 11
18 <170> SOFTWARE: FastSEQ for Windows Version 4.0
20 <210> SEQ ID NO: 1
21 <211> LENGTH: 331
22 <212> TYPE: PRT
23 <213> ORGANISM: Artificial Sequence
25 <220> FEATURE:
26 <223> OTHER INFORMATION: Synthetically generated proteins
28 <400> SEQUENCE: 1
29 Asp Asn Lys Thr Phe Ser Val Cys Ser Arg Asp Phe Thr Pro Pro Thr
30 1 5 10 15
31 Val Lys Ile Leu Gln Ser Ser Cys Asp Gly Gly Gly His Phe Pro Pro
32 20 25 30
33 Thr Ile Gln Leu Leu Cys Leu Val Ser Gly Tyr Thr Pro Gly Thr Ile
34 35 40 45
35 Asn Ile Thr Trp Leu Glu Asp Gly Gln Val Met Asp Val Asp Leu Ser
36 50 55 60
37 Thr Ala Ser Thr Thr Gln Glu Gly Glu Leu Ala Ser Thr Gln Ser Glu
38 65 70 75 80
39 Leu Thr Leu Ser Gln Lys His Trp Leu Ser Asp Arg Thr Tyr Thr Cys
40 85 90 95
41 Gln Val Thr Tyr Gln Gly His Thr Phe Glu Asp Ser Thr Lys Lys Cys
42 100 105 110
43 Ala Asp Ser Asn Pro Arg Gly Val Ser Ala Tyr Leu Ser Arg Pro Ser
44 115 120 125
45 Pro Phe Asp Leu Phe Ile Arg Lys Ser Pro Thr Ile Thr Cys Leu Val
46 130 135 140
47 Val Asp Leu Ala Pro Ser Lys Gly Thr Val Asn Leu Thr Trp Ser Arg
48 145 150 155 160
49 Ala Ser Gly Lys Pro Val Asn His Ser Thr Arg Lys Glu Glu Lys Gln
50 165 170 175
51 Arg Asn Gly Thr Leu Thr Val Thr Ser Thr Leu Pro Val Gly Thr Arg
52 180 185 190
53 Asp Trp Ile Glu Gly Glu Thr Tyr Gln Cys Arg Val Thr His Pro His
54 195 200 205
55 Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Thr Ser Gly Pro Arg
56 210 215 220
57 Ala Ala Pro Glu Val Tyr Ala Phe Ala Thr Pro Glu Trp Pro Gly Ser
58 225 230 235 240
59 Arg Asp Lys Arg Thr Leu Ala Cys Leu Ile Gln Asn Phe Met Pro Glu

ENTERED

RECEIVED
JUN 26 2000
INTER 16012900

RAW SEQUENCE LISTING DATE: 06/05/2000
 PATENT APPLICATION: US/09/401,636 TIME: 10:34:53

Input Set : A:\Sequence
 Output Set: N:\CRF3\06022000\I401636.raw

```

60      245      250      255
61 Asp Ile Ser Val Gln Trp Leu His Asn Glu Val Gln Leu Pro Asp Ala
62          260          265          270
63 Arg His Ser Thr Thr Gln Pro Arg Lys Thr Lys Gly Ser Gly Phe Phe
64          275          280          285
65 Val Phe Ser Arg Leu Glu Val Thr Arg Ala Glu Trp Glu Gln Lys Asp
66          290          295          300
67 Glu Phe Ile Cys Arg Ala Val His Glu Ala Ala Ser Pro Ser Gln Thr
68 305          310          315          320
69 Val Gln Arg Ala Val Ser Val Asn Pro Gly Lys
70          325          330
72 <210> SEQ ID NO: 2
73 <211> LENGTH: 340
74 <212> TYPE: PRT
75 <213> ORGANISM: Artificial Sequence
77 <220> FEATURE:
78 <223> OTHER INFORMATION: Synthetically generated proteins
80 <400> SEQUENCE: 2
81 Asp Leu Thr Ile Arg Ala Arg Pro Val Asn Ile Thr Lys Pro Thr Val
82   1          5          10          15
83 Asp Leu Leu His Ser Ser Cys Asp Pro Asn Ala Phe His Ser Thr Ile
84          20          25          30
85 Gln Leu Tyr Cys Phe Val Tyr Gly His Ile Gln Asn Asp Val Ser Ile
86          35          40          45
87 His Trp Leu Met Asp Asp Arg Lys Ile Tyr Glu Thr His Ala Gln Asn
88          50          55          60
89 Val Leu Ile Lys Glu Glu Gly Lys Leu Ala Ser Thr Tyr Ser Arg Leu
90 65          70          75          80
91 Asn Ile Thr Gln Gln Trp Met Ser Glu Ser Thr Phe Thr Cys Lys
92          85          90          95
93 Val Thr Ser Gln Gly Glu Asn Tyr Trp Ala His Thr Arg Arg Cys Ser
94          100         105         110
95 Asp Asp Glu Pro Arg Gly Val Ile Thr Tyr Leu Ile Pro Pro Ser Pro
96          115         120         125
97 Leu Asp Leu Tyr Glu Asn Gly Thr Pro Lys Leu Thr Cys Leu Val Leu
98          130         135         140
99 Asp Leu Glu Ser Glu Glu Asn Ile Thr Val Thr Trp Val Arg Glu Arg
100 145         150         155         160
101 Lys Lys Ser Ile Gly Ser Ala Ser Gln Arg Ser Thr Lys His His Asn
102          165         170         175
103 Ala Thr Thr Ser Ile Thr Ser Ile Leu Pro Val Asp Ala Lys Asp Trp
104          180         185         190
105 Ile Glu Gly Glu Gly Tyr Gln Cys Arg Val Asp His Pro His Phe Pro
106          195         200         205
107 Lys Pro Ile Val Arg Ser Ile Thr Lys Ala Pro Gly Lys Arg Ser Ala
108          210         215         220
109 Pro Glu Val Tyr Val Phe Leu Pro Pro Glu Glu Glu Lys Asp Lys
110 225         230         235         240
111 Arg Thr Leu Thr Cys Leu Ile Gln Asn Phe Phe Pro Glu Asp Ile Ser

```

RAW SEQUENCE LISTING
PATENT APPLICATION: US/09/401,636

DATE: 06/05/2000
TIME: 10:34:53

Input Set : A:\Sequence
Output Set: N:\CRF3\06022000\I401636.raw

```

112      245          250          255
113 Val Gln Trp Leu Gln Asp Ser Lys Leu Ile Pro Lys Ser Gln His Ser
114          260          265          270
115 Thr Thr Thr Pro Leu Lys Tyr Asn Gly Ser Asn Gln Arg Phe Phe Ile
116          275          280          285
117 Phe Ser Arg Leu Glu Val Thr Lys Ala Leu Trp Thr Gln Thr Lys Gln
118          290          295          300
119 Phe Thr Cys Arg Val Ile His Glu Ala Leu Arg Glu Pro Arg Lys Leu
120 305          310          315          320
121 Glu Arg Thr Ile Ser Lys Ser Leu Gly Asn Thr Ser Leu Arg Pro Ser
122          325          330          335
123 Gln Ala Ser Met
124          340
126 <210> SEQ ID NO: 3
127 <211> LENGTH: 341
128 <212> TYPE: PRT
129 <213> ORGANISM: Artificial Sequence
131 <220> FEATURE:
132 <223> OTHER INFORMATION: Synthetically generated proteins
134 <400> SEQUENCE: 3
135 Glu Phe His His His His His His Thr Leu Ser Leu Pro Glu Ser Gly
136 1          5          10          15
137 Pro Val Thr Ile Ile Pro Pro Thr Val Lys Leu Phe His Ser Ser Cys
138          20          25          30
139 Asp Pro Arg Gly Asp Ala His Ser Thr Ile Gln Leu Leu Cys Leu Val
140          35          40          45
141 Ser Gly Phe Ser Pro Ala Lys Val His Val Thr Trp Leu Val Asp Gly
142          50          55          60
143 Gln Glu Ala Glu Asn Leu Phe Pro Tyr Thr Thr Arg Pro Lys Arg Glu
144          65          70          75          80
145 Gly Gly Gln Thr Phe Ser Leu Gln Ser Glu Val Asn Ile Thr Gln Gly
146          85          90          95
147 Gln Trp Met Ser Ser Asn Thr Tyr Thr Cys His Val Lys His Asn Gly
148          100         105         110
149 Ser Ile Phe Glu Asp Ser Ala Gln Lys Cys Ser Asp Thr Asp Pro Arg
150          115         120         125
151 Gly Ile Ser Ala Tyr Ile Leu Pro Pro Thr Pro Gln Asp Leu Phe Val
152          130         135         140
153 Lys Lys Val Pro Thr Ile Gly Cys Leu Ile Val Asp Leu Ala Ser Ala
154 145          150          155          160
155 Glu Asn Val Lys Val Thr Trp Ser Arg Glu Ser Gly Gly Pro Val Asn
156          165          170          175
157 Pro Ser Ser Leu Val Val Lys Glu Gln Tyr Asn Gly Thr Phe Thr Val
158          180          185          190
159 Thr Ser His Leu Pro Val Asn Thr Asp Asp Trp Ile Glu Gly Asp Thr
160          195          200          205
161 Tyr Thr Cys Arg Leu Glu Ser Pro Asp Met Pro Val Pro Leu Ile Arg
162          210          215          220
163 Thr Ile Ser Lys Ala Pro Gly Lys Arg Leu Ala Pro Glu Val Tyr Met

```

RECEIVED
JUN 26 2000
U.S. Patent and Trademark Office

RAW SEQUENCE LISTING DATE: 06/05/2000
 PATENT APPLICATION: US/09/401,636 TIME: 10:34:53

Input Set : A:\Sequence
 Output Set: N:\CRF3\06022000\I401636.raw

```

164 225          230          235          240
165 Leu Pro Pro Ser Pro Glu Glu Thr Gly Thr Thr Arg Thr Val Thr Cys
166          245          250          255
167 Leu Ile Arg Gly Phe Tyr Pro Ser Glu Ile Ser Val Gln Trp Leu Phe
168          260          265          270
169 Asn Asn Glu Glu Asp His Thr Gly His His Thr Thr Thr Arg Pro Gln
170          275          280          285
171 Lys Asp His Gly Thr Asp Pro Ser Phe Phe Leu Tyr Ser Arg Met Leu
172          290          295          300
173 Val Asn Lys Ser Ile Trp Glu Lys Gly Asn Leu Val Thr Cys Arg Val
174 305          310          315          320
175 Val His Glu Ala Leu Pro Gly Ser Arg Thr Leu Glu Lys Ser Leu His
176          325          330          335
177 Tyr Ser Ala Gly Asn
178          340
180 <210> SEQ ID NO: 4
181 <211> LENGTH: 341
182 <212> TYPE: PRT
183 <213> ORGANISM: Artificial Sequence
185 <220> FEATURE:
186 <223> OTHER INFORMATION: Synthetically generated proteins
188 <400> SEQUENCE: 4
189 Glu Phe His His His His His His His Thr Leu Ser Leu Pro Glu Ser Gly
190 1          5          10          15
191 Pro Val Thr Ile Ile Pro Pro Thr Val Lys Leu Phe His Ser Ser Cys
192          20          25          30
193 Asp Pro Arg Gly Asp Ala His Ser Thr Ile Gln Leu Leu Cys Leu Val
194          35          40          45
195 Ser Gly Phe Ser Pro Ala Lys Val His Val Thr Trp Leu Val Asp Gly
196          50          55          60
197 Gln Glu Ala Glu Asn Leu Phe Pro Tyr Thr Thr Arg Pro Lys Arg Glu
198 65          70          75          80
199 Gly Gly Gln Thr Phe Ser Leu Gln Ser Glu Val Asn Ile Thr Gln Gly
200          85          90          95
201 Gln Trp Met Ser Ser Asn Thr Tyr Thr Cys His Val Lys His Asn Gly
202          100         105         110
203 Ser Ile Phe Glu Asp Ser Ser Arg Arg Cys Ser Asp Asp Glu Pro Arg
204          115         120         125
205 Gly Val Ile Thr Tyr Leu Ile Pro Pro Ser Pro Leu Asp Leu Tyr Glu
206          130         135         140
207 Asn Gly Thr Pro Lys Leu Thr Cys Leu Val Leu Asp Leu Glu Ser Glu
208 145         150         155         160
209 Glu Asn Ile Thr Val Thr Trp Val Arg Glu Arg Lys Lys Ser Ile Gly
210          165         170         175
211 Ser Ala Ser Gln Arg Ser Thr Lys His His His Ala Thr Thr Ser Ile
212          180         185         190
213 Thr Ser Ile Leu Pro Val Asp Ala Lys Asp Trp Ile Glu Gly Glu Gly
214          195         200         205
215 Tyr Gln Cys Arg Val Asp His Pro His Phe Pro Lys Pro Ile Val Arg

```

RAW SEQUENCE LISTING DATE: 06/05/2000
 PATENT APPLICATION: US/09/401,636 TIME: 10:34:53

Input Set : A:\Sequence
 Output Set: N:\CRF3\06022000\I401636.raw

```

216      210          215          220
217 Ser Ile Thr Lys Leu Pro Gly Lys Arg Leu Ala Pro Glu Val Tyr Met
218 225          230          235          240
219 Leu Pro Pro Ser Pro Glu Glu Thr Gly Thr Thr Arg Thr Val Thr Cys
220          245          250          255
221 Leu Ile Arg Gly Phe Tyr Pro Ser Glu Ile Ser Val Gln Trp Leu Pro
222          260          265          270
223 Asn Asn Glu Glu Asp His Thr Gly His His Thr Thr Arg Pro Gln
224          275          280          285
225 Lys Asp His Gly Thr Asp Pro Ser Phe Phe Leu Tyr Ser Arg Met Leu
226          290          295          300
227 Val Asn Lys Ser Ile Trp Glu Lys Gly Asn Leu Val Thr Cys Arg Val
228 305          310          315          320
229 Val His Glu Ala Leu Pro Gly Ser Arg Thr Leu Glu Lys Ser Leu His
230          325          330          335
231 Tyr Ser Ala Gly Asn
232          340
234 <210> SEQ ID NO: 5
235 <211> LENGTH: 342
236 <212> TYPE: PRT
237 <213> ORGANISM: Artificial Sequence
239 <220> FEATURE:
240 <223> OTHER INFORMATION: Synthetically generated proteins
242 <400> SEQUENCE: 5
243 Glu Phe His His
244 1          5          10          15
245 Pro Val Thr Ile Ile Pro Pro Thr Val Lys Leu Phe His Ser Ser Cys
246          20          25          30
247 Asp Pro Arg Gly Asp Ala His Ser Thr Ile Gln Leu Leu Cys Leu Val
248          35          40          45
249 Ser Gly Phe Ser Pro Ala Lys Val His Val Thr Trp Leu Val Asp Gly
250          50          55          60
251 Gln Glu Ala Glu Asn Leu Phe Pro Tyr Thr Thr Arg Pro Lys Arg Glu
252          65          70          75          80
253 Gly Gly Gln Thr Phe Ser Leu Gln Ser Glu Val Asn Ile Thr Gln Gly
254          85          90          95
255 Gln Trp Met Ser Ser Asn Thr Tyr Thr Cys His Val Lys His Asn Gly
256          100         105         110
257 Ser Ile Phe Glu Asp Ser Ser Arg Arg Cys Ser Asp Asp Glu Pro Arg
258          115         120         125
259 Gly Val Ile Thr Tyr Leu Ile Pro Pro Ser Pro Leu Asp Leu Tyr Glu
260          130         135         140
261 Asn Gly Thr Pro Lys Leu Thr Cys Leu Val Leu Asp Leu Glu Ser Glu
262 145         150         155         160
263 Glu Asn Ile Thr Val Thr Trp Val Arg Glu Arg Lys Lys Ser Ile Gly
264          165         170         175
265 Ser Ala Arg Ser Leu Val Val Lys Glu Gln Tyr Asn Gly Thr Phe Thr
266          180         185         190
267 Val Thr Ser His Leu Pro Val Asn Thr Asp Asp Trp Ile Glu Gly Asp

```

VERIFICATION SUMMARY DATE: 06/05/2000
PATENT APPLICATION: US/09/401,636 TIME: 10:34:54

Input Set : A:\Sequence
Output Set: N:\CRF3\06022000\I401636.raw